

IN THE DRAWINGS

The attached sheet of drawings includes changes to Fig. 1. This sheet, which includes Fig. 1, replaces the original sheet including Fig. 1.

Attachment: Replacement Sheet (1)

REMARKS

Favorable reconsideration of this application is respectfully requested.

The specification is amended to correct minor informalities and a new Abstract believed to be in more proper format under United States practice is submitted.

Further, submitted with the present response is a replacement Figure 1 that corrects a mislabeling of elements “44” and “46”.

Further, claim 1 is amended as suggested in the Office Action at page 2, prenumbered paragraph 2, to address the minor informalities therein.

Claims 1-8 are pending in this application. Claims 5-8 are herein added. Claim 4 is amended to no longer be written as an improper multiple dependent claim and subject matter of the canceled multiple dependencies is added in new dependent claims 5 and 6. New dependent claims 7 and 8 are also submitted that recite additional features of the main pipe, which are believed to be clear from Figure 1 in the specification. Thereby, applicants submit the submission of new claims 5-8 does not add any new matter.

Claims 1-4 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent Application Publication 2003/0122543 to Shirakawa et al. (herein “Shirakawa”) in view of WO 2004/079340 to Hariharan et al. (herein “Hariharan”). That rejection is traversed as now discussed.

Independent claim 1 is herein amended to clarify features recited therein, and particularly now further recites “wherein the outer tube and the lower inner tube are connected to each other through the condensing tube”. Applicants submit that subject matter is clear for example from Figure 1 in the present specification showing the upper supporting tube 41 and the lower inner tube 45 connected to each other through the condensing tube 42.

Applicants submit the features recited in the claims as written distinguish over the applied art.

The outstanding rejection relies on Shirakawa as the primary reference, but recognizes Shirakawa does not disclose specific features of the main tube, particularly being formed of an upper supporting tube, a condensing tube, a lower inner tube, and an outer tube. To cure such recognized deficiencies in Shirakawa, the outstanding Office Action cites Hariharan for example at Figure 3 showing different tube portions.¹

In reply to the grounds for the rejection, applicants first submit Shirakawa is not even related to a device similar to that in the claimed invention. Applicants first note Shirakawa is not even directed to a device that cools an inside of a main pipe 23 by using a cooling action, for example from a sample of chamber 12. As shown for example in Figures 2(b) and 3 Shirakawa discloses a vacuum insulation member 29 provided on a lower periphery of a main pipe 23. In Shirakawa accordingly the inside of the main pipe 23 is not subjected to a cooling action from a sample chamber 12 that is cooled by helium gas, see for example Shirakawa at paragraph [0035].

The present invention can also achieve a benefit of reducing a background signal that may be present under a magnetic field even when no sample is provided. Shirakawa is not directed to such a device. In contrast to Shirakawa the present invention can provide a function of reducing a background signal by a specific tube structure.

Further, applicants submit Hiraharan does not disclose the specific tube structure recited in the claims as currently written. Specifically, the claims as written recite:

wherein the main pipe is formed, sequentially from top to bottom, of an upper supporting tube, a condensing tube, a lower inner tube and an outer tube adapted to form an insulated vacuum chamber between the outer tube and the lower inner tube

wherein the upper supporting tube and the lower inner tube are connected to each other through the condensing tube, and

wherein the lower inner tube is formed of titanium.

¹ Office Action of November 4, 2009, page 5, lines 1-10.

Applicants submit the point contact probe disclosed in Hiraharan is used to maintain a temperature in a range between 2k and 300K (Hiraharan at page 5, lines 4-9). One benefit in the claimed invention is the structure therein can maintain a temperature range such as from 0.3K to 1.8K (specification for example at paragraph [0030]). Hiraharan cannot realize such a result.

Applicants further submit Hiraharan differs from the claimed invention as Hiraharan does not disclose or suggest the structure of the main pipe including a “lower inner pipe and an outer tube adapted to form an insulated vacuum chamber between the outer tube and the lower inner tube”.

With respect to forming an “insulating vacuum chamber” the outstanding Office Action first cites Hiraharan at the inside of element 20 and at page 17, paragraph 3.² Applicants submit Hiraharan does not disclose the claimed features. Specifically, in the claimed measurement system the insulated vacuum chamber is formed between two tube walls of an outer tube and a lower inner tube. Hiraharan does not disclose such a structure as the inside of the elongate garolite tube 20 is not formed between two tube walls of an outer tube and a lower inner tube. Thereby, the “insulated vacuum chamber” structure is neither taught nor suggested by the citations in Hiraharan.

The grounds for rejection also refers to an insulated vacuum chamber formed “between the outer tube (lower section of 22) and the lower inner tube (44)” in Hiraharan.³ In reply, applicants note in Hiraharan the sleeve 44 is moved in the copper housing 22 in a longitudinal direction (Hiraharan for example at page 15, lines 2-5), and a space inside the copper housing 22 in which the sleeve 44 is moved *is exposed to the outside* of the copper housing via an arched window, see for example Figures 4A and 4B in Hiraharan. Therefore, in Hiraharan the space between the copper housing 22 and the sleeve 44 does not form an

² Office Action of November 4, 2009, page 5, lines 7-9.

³ Office Action of November 4, 2009, page 5, lines 8-9.

“insulated vacuum chamber”. That is, that noted space in Hiraharan is not an “insulated vacuum chamber” but instead is exposed to the outside.

In view of the foregoing comments applicants submit Hiraharan does not disclose or suggest the “insulated vacuum chamber” as claimed.

Applicants further submit Hiraharan does not disclose or suggest a main pipe and tube including a “condensing tube”. Hiraharan does not disclose holding any gas in a leak-tight manner, and thereby no gas can be condensed into a liquid in Hiraharan, and thus Hiraharan does not disclose or suggest the claimed “condensing tube”.

Hiraharan further notes therein with respect to the tube that “[t]he sample is placed onto a puck that is used for resistivity measurements in the PPMS” (Hiraharan at page 4, lines 18-21). Hiraharan further discloses, as a specific example of the puck, only the resistivity puck 54 being fixed on an outside of a distal end of a copper housing 22 (Hiraharan at page 14, lines 11-12).

Applicants further submit that structure in Hiraharan indicates the sample to be measured is not fixed inside of the copper housing 22 but instead is fixed outside thereof.

Thereby, applicants submit the cited titanium sleeve 44 in Figure 3 in Hiraharan does not correspond to the claimed “lower inner tube” and the lower section of the copper housing 22 from step near 46 or 38a down to landing beyond tip 52 does not correspond to the claimed “outer tube”. Applicants further submit the cited stainless steel rod 30 in Figure 3 of Hiraharan does not correspond to the “upper supporting tube” as claimed.

In that respect applicants note the claims now further recite the “upper supporting tube and the lower inner tube are connected to each other through the condensing tube”. As noted above Hiraharan does not even disclose a condensing tube, and applicants further note in Hiraharan the cited condensing tube of the top section 22 does not connect to each other the cited upper supporting tube 30 and the cited lower inner tube 44.

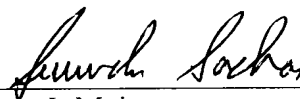
In view of these foregoing comments, applicants submit the cited contact probe in Hiraharan is completely different in structure and operation from the “main pipe” as recited in independent claim 1, and thereby Hiraharan cannot cure the recognized deficiencies in Shirakawa with respect to the claims as currently written.

In view of the foregoing comments, applicants submit the features positively recited in amended independent claim 1 as currently written, and accordingly the claims dependent therefrom, distinguish over the applied art to Shirakawa in view of Hiraharan.

As no other issues are pending in this application, it is respectfully submitted the present application is in condition for allowance, and it is hereby respectfully requested that this case be passed to issue.

Respectfully submitted,

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